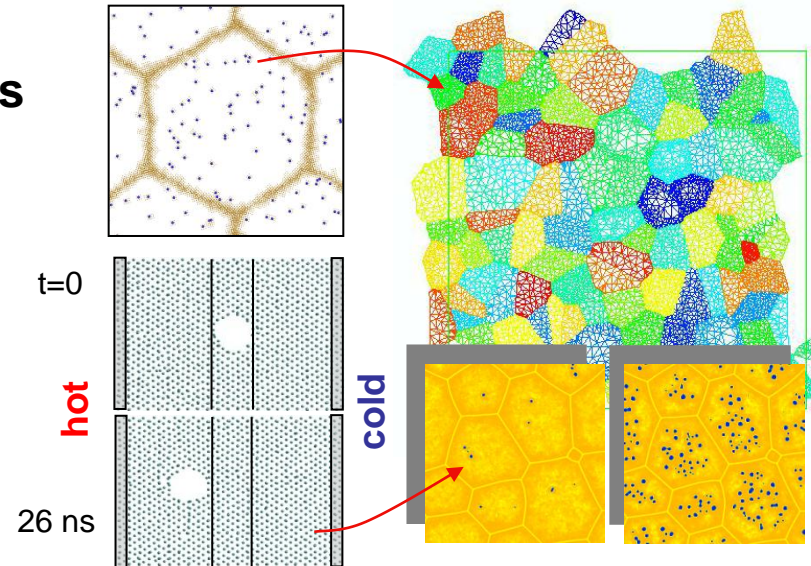




**Summary:** The central theme of the Center is *'Microstructure Science under Irradiation'*, i.e., the determination of how concurrent microstructure formation and evolution under irradiation control the thermo-mechanical behavior of  $\text{UO}_2$  as a model nuclear-fuel material.



## RESEARCH PLAN AND DIRECTIONS

Develop an *experimentally validated, multi-scale modeling approach* for microstructure evolution under irradiation (void-, fission-gas and phase behavior, stress development, ...) and predict how these affect, e.g., thermal transport. Incorporation of microstructural processes based on atomic-level mechanisms is critical towards developing a *predictive* fuels-performance capability.